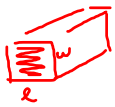
## Ch. 1 Measurement + Geometry

Composite figure: made up of 2 or more different geometric shapes

Formulas:

AREA
- rectangle $A = \ell \cdot w$
- circle $A = \pi r^2$
- triangle $A = \frac{bh}{2}$

VOLUME
- prism $V = (\text{Area of base})(h)$  $V = \ell w h$ (base)
- cylinder $V = \pi r^2 h$ 

SURFACE AREA
- prism $SA = 2(\ell w + wh + h\ell)$
- cylinder $SA = 2\pi r^2 + 2\pi rh$

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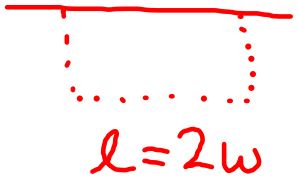
# Optimizing

2-Dimensional

- 4 sided → maximize area → min. perimeter } Square
- 3 sided  make length twice width

$\ell = 2w$

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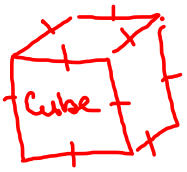
# Optimizing

3D → minimize surface area (cost of building - packaging material / paint) + maximizes volume.



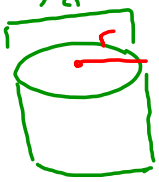

$V = lwh$ but $w = l$, $h = l$

$V = l \cdot l \cdot l$

$\boxed{V = l^3}$ $\boxed{SA = 6l^2}$

ONLY FOR Cube

Cylinder




- want the most Volume + the least SA

$h = d$ remember $d = 2r$

$\boxed{V = 2\pi r^3}$ $\boxed{SA = 6\pi r^2}$

ONLY for cylinder with $h = d$

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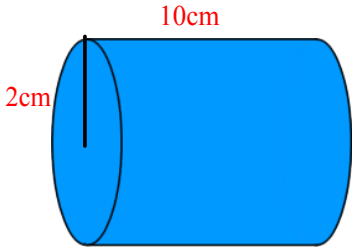
## Ex. 1 Find the Volume + surface area




$V = \pi r^2 h$

$V = \pi(2)^2(10)$

$V = \pi(4)(10)$

$V = 40\pi$

$\boxed{V = 125.7\ cm^3}$

$SA = 2\pi r^2 + 2\pi rh$

$= 2\pi(2)^2 + 2\pi(2)(10)$

$= 2\pi(4) + 2\pi(20)$

$= 8\pi + 40\pi$

$= 48\pi$

$\boxed{= 150.8\ cm^2}$

Note - units

V = cubed

SA = squared.

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# Ex. 2 Find the length of a cube with a volume of $4096cm^3$

$V = lwh$

$V = 4096\,cm^3$ $\quad V = l^3$

$4096 = l^3$

$\sqrt[3]{4096} = \sqrt[3]{l^3}$

$16 = l$

$\therefore$ the length of cube is 16

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